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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

A Palace Was Here

See Page 278

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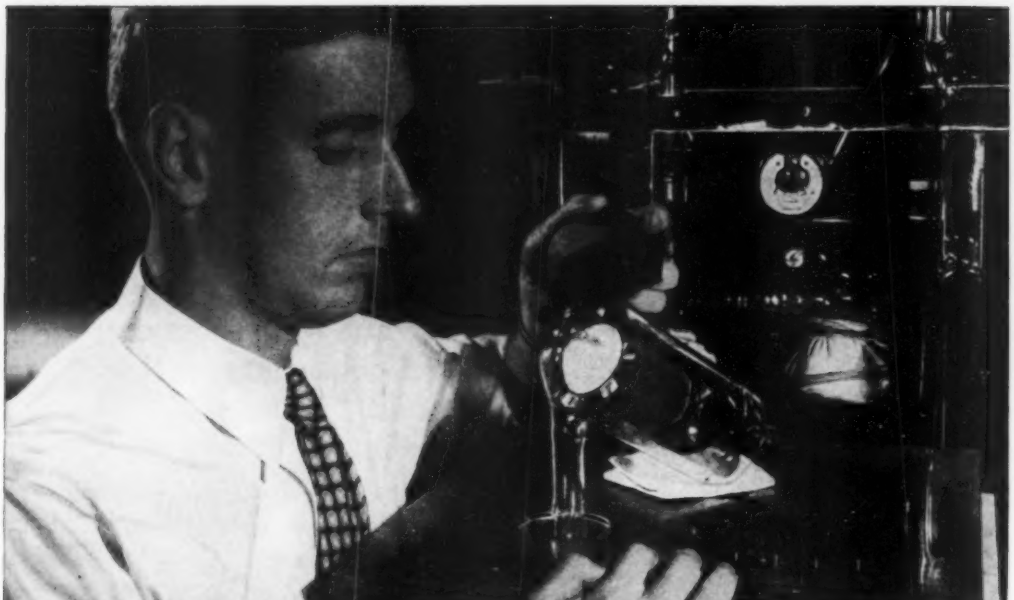

Arthur E. Anderson, Professor of Electrical Engineering at the University of Connecticut, was one of the 21 college professors who spent the summer months last year working with the men who design and build electrical equipment for the Westinghouse Electric Corporation. The program is designed to provide college instructors with practical experience in industry. Here, as part of a research project, Mr. Anderson is using a small magnet to change the position of a metal disc enclosed in a glass tube.

Westinghouse Plan Enables Professors to Deal with Actual Industrial Problems . . .

Through a "lend-lease" program with leading engineering colleges, Westinghouse hopes to enable professors of those schools to get a greater understanding of industrial research, design and manufacturing problems.

Here's the way the plan works: professors from co-operating engineering schools spend their summer months at Westinghouse—actually helping to design and build electrical equipment they discuss in their classrooms. They work side by side with Westinghouse men who design and build electrical apparatus.

In this way, Westinghouse hopes to contribute to the flow of well-trained and competent engineers coming from America's educational institutions.

Other Westinghouse co-operation with colleges is by supporting 42 fellowships, 149 scholarships, 5 professorships, and a graduate study program through which Westinghouse employees may work toward advanced degrees at seven co-operating universities.

These activities indicate the breadth of Westinghouse interest in furthering scientific development. Westinghouse Electric Corporation, Pittsburgh 30, Pa.

G-10135

YOU CAN BE SURE..IF IT'S Westinghouse

ARCHAEOLOGY

Huge Palace in Palestine

Uncover huge structure in Jericho that may have been built by Roman ruler, Herod, or his son. Dried up tomato plants in soil over ancient walls aided discovery.

See Front Cover

➤ THE LARGEST ancient palace yet known in Palestine has been discovered and excavated this year at Jericho, not far from the north in the Hashemite Kingdom of Jordan.

The work has been done by the American School of Oriental Research in Jerusalem, under the direction of Prof. James B. Pritchard, of Crozer Theological Seminary, Chester, Pa.

The excavation was done in a former tomato patch which later was restored to its original condition by agreement with the Arab landlord. Announcement of the discovery was made at Yale University where the ASOR has its headquarters.

The palace was a large rectangular structure about the size of a football field, measuring 284 by 152 feet, and contained 36 rooms built around a colonnaded open court. The building was constructed of cut sandstone, which was plastered over and then painted with brilliant colors.

The front cover of this week's SCIENCE NEWS LETTER shows a general view of the excavations at the site.

In the tropical climate of the Dead Sea, approximately one-quarter mile below sea level, the ruling class of Jerusalem during the Roman period found refuge from the damp, cold winters of the capital. The palace enjoyed an imposing view of the north shore of the Dead Sea, and at the same time was sheltered from the winter winds by the near-by hills to the west.

This area, which blossoms all winter and produces bananas, oranges, grapefruit and dates, is supplied with abundant water from springs in the surrounding mountains. It is still the resort of royalty. Just across the Jordan River, the present ruler of Hashemite Jordan, King Abdullah, has his winter residence at Shuneh.

The palace discovered this past winter dates from the time of Christ and may have been built by Herod the Great (37 B.C.—4 B.C.) or by his son Archelaus, who ruled after him for ten years. Many coins belonging to both of these rulers were found. According to the historian, Josephus, Herod built a palace in Jericho and there murdered his brother-in-law Aristobalus. In the same history there is an account of the burning of the palace upon Herod's death and of its being elaborately rebuilt by his son Archelaus. Evidence for burning and reconstruction was found in the excavation.

The building was not only imposing in size; it was luxurious. There were elaborate baths—both hot and cold—and mosaic floors of artistic design. Wine jars which had been imported from the islands of the Mediterranean, and a large hoard of more than 120 jugs for holding perfumed ointment were found in the palace area.

The mild winter climate of Jericho, much like an English summer, made it possible to live out of doors much of the time. The rooms were arranged around open courts. One small court had in it 20 pedestals of well-cut stone, probably for the purpose of supporting stone jars containing flowers.

When the building fell into disuse much of the good stone was looted for building purposes elsewhere and for the repair of the old Roman road which runs from Jerusalem down to Jericho. Some of the finest pieces of cornice work found this season were pulled out from under this ancient road, which is mentioned in connection with the story of the Good Samaritan in the Bible.

The site had been extensively occupied at about 3000 B.C., but had been abandoned for centuries until the Romans cut their foundations through the debris left by the earlier inhabitants. It was again occupied by the Arabs during the Eighth Century. During the Roman times, the palace was well supplied with fresh water brought down from the mountain in a concrete conduit. Parts of this ancient canal are still used by the Arabs who live in Jericho today.

The Roman palace was nowhere visible when work began this year. However, the excavators were able to trace some of the lines of the palace walls by the drying up of tomato plants growing in the thin soil immediately over the ancient walls. This observation led to the excavation and to the subsequent discovery of the palace immediately below a winter crop of tomatoes.

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● RADIO

Saturday, May 12, 1951, 3:15-3:30 p. m., EDT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Award ceremony of the Second National Science Fair from the Exhibit Hall, Washington University, St. Louis, Mo. Winning exhibitors will be interviewed and prizes awarded.

COLUMN BASES—These are the bases of columns or pedestals lining the small court in the ancient Roman palace discovered in Jericho.

ARCHAEOLOGY

Stone Age Had Farmers

Report evidence that 8,000 years ago, men farmed in Iran. Radiocarbon calendar was used to date remains. Layers showed progressive civilization.

➤ Evidence that 6,000 years before the birth of Christ, men raised goats for meat and milk, grew grain for food and sheared sheep for clothing was reported in Philadelphia.

Remains of the world's first known farmers were discovered in a cave on a hillside in Iran, about 50 miles from the Russian border. The discovery was made by Dr. Carleton S. Coon, of the University Museum of the University of Pennsylvania.

The finds were dated by Dr. Willard F. Libby, nuclear physicist at the University of Chicago, who found that the radioactive carbon clock placed the time that these earliest farmers lived at about 6050 B.C.

A total of 28 layers was successively unearthed, showing that this same Belt Cave served as a home for successive generations of men from the Middle Stone Age through the New Stone Age. During this time culture developed. The oldest of the inhabitants of the cave knew only how to hunt wild animals for their meat and skins. Later they herded animals for milk and wool. Later still they began to cultivate the soil and grow grain and to make pottery dishes.

Earliest animal to be domesticated was the goat, Dr. Coon found. Then came the sheep and later the pig and the ox.

The Stone Age men who lived in this cave knew how to make sickles to cut their grain. Evidence of the use to which their stone blades were put was found in a coating on the cutting edge due to the silica in the grain stems. Some were coated on one edge; others had two cutting edges.

The baked pottery left behind by the Stone Age farmers was tempered with chaff when it was fired, another evidence of the growing of grain.

Among the 31,000 bones and other objects found in the cave were a few remains of the human occupants themselves. The skull of a 12-year-old girl was among the finds. She was of the Neanderthal type, and lived in the Middle Stone Age period, about ten or twelve thousand years ago. Remains of two adults were also unearthed.

The Stone Age farmers grew their grain and raised their herds in an ideal location, Dr. Coon points out. Near the coastline of the Caspian Sea, they had an ideal temperate climate for early agriculture. It never freezes in that area and there is adequate rainfall to sustain a rich soil.

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ARCHAEOLOGY

Find Ancient Fingerprints Clear 3,500 Years Later

➤ FINGERPRINTS of men who sealed jars containing oil, probably about 3,500 years ago, were still clear when the jars were unearthed during excavations in 1950.

This was reported by Dr. Alan J. B. Wace, professor of archaeology at Farouk I University, Alexandria, Egypt. He told the American Philosophical Society meeting in Philadelphia of the discovery of an important house with a large basement in the excavations at Mycenae, Greece.

In one room of the basement stood the thirty "stirrup jars" for oil which had been stoppered with clay and sealed with their owners' signets. The still clear fingerprints were found on these jars. Beneath the floor were fragments of "gaily colored frescoes" from a yet earlier building.

The Mycenae excavations are supported by the American Philosophical Society under the direction of the British School at Athens, with assistance from the Universities of Cambridge and Oxford, England, and the British Academy.

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Question Box

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GENERAL SCIENCE

Academy Elects Members

Dr. Alexander Wetmore is new home secretary for the "Senate of American science." Drs. Beams and Stakman elected to Council of the Academy.

➤ DR. ALEXANDER WETMORE, Smithsonian Institution secretary, was elected home secretary of the National Academy of Sciences at its recent meeting in Washington, D. C.

He will serve a four-year term, beginning July 1, in this non-salaried but highly prized post, succeeding Dr. Fred E. Wright, research physicist with Carnegie Institution of Washington, who has served as home secretary of the Academy for the past 20 years.

Two new members were elected to the Council of the Academy to serve until June 30, 1954: Dr. J. W. Beams, chairman of the school of physics, University of Virginia, and Dr. E. C. Stakman, chief of the division of plant pathology and botany, University of Minnesota.

The newly elected members of the Academy are:

W. C. Allee, head of department of biology, University of Florida, Gainesville; Norris E. Bradbury, director of Los Alamos Scientific Laboratory, Los Alamos, N. M.; Dirk Brouwer, director of Yale Observatory, New Haven; Roy E. Clausen, chairman of division of genetics, University of California, Berkeley; E. DeGolyer, senior partner of DeGolyer and MacNaughton, Dallas; John T. Edsall, associate professor of biological chemistry, Harvard Medical School, Boston; Raymond M. Fuoss, Sterling professor of chemistry, Yale University, New Haven; Ross Gunn, director of division of physical research, U. S. Weather Bureau, Washington, D. C.; Harry F. Harlow, chairman of department of psychology, University of Wisconsin, Madison; Columbus O'D. Iselin, senior physical oceanographer at Woods Hole Oceanographic Institution, Woods Hole, Mass.; Remington Kellogg, director of U. S. National Museum, Washington, D. C.; Robert H. Kent, associate director of Ballistic Research Laboratories, Aberdeen Proving Ground, Md.; Donald William Kerst, professor of physics, University of Illinois, Urbana; Charles G. King, director of Nutrition Foundation, New York; S. K. Lothrop, curator of Andean Archaeology at Peabody Museum, Harvard University, Cambridge; Thomas B. Nolan, assistant director of U. S. Geological Survey, Washington, D. C.; E. M. Purcell, professor of physics, Harvard University, Cambridge; A. J. Riker, professor of plant pathology, University of Wisconsin, Madison; H. P. Robertson, professor of mathematical physics, California Institute of Technology, Pasadena; Frederick D. Rossini, chairman of department of chemistry, Carnegie Institute of Technology, Pittsburgh; Albert B. Sabin, professor of research pediatrics, Children's Hospital Research Foundation, Cincinnati; Franz Schrader, head of department of zoology, Columbia University, New York; Frederick Seitz, research professor of physics, University of Illinois, Urbana; William Shockley, research physicist at Bell Telephone Laboratories, Murray Hill, N. J.; Thomas G. Thompson, director of Oceanographic Laboratories, University of Washington, Seattle; William S. Tillett, head of department of medicine, New York University College of Medicine, New York; G. T. Whyburn, chairman of department of mathematics, University of Virginia, Charlottesville; Carl J. Wiggers, professor of physiology, Western Reserve University School of Medicine, Cleveland; and W. G. Young, dean of division of physical science, California Institute of Technology, Pasadena.

New foreign associates elected were:

Pentti Eskola, professor of geology and mineralogy, Helsinki University; Sir Godfrey Thomson, professor of education, Edinburgh University; and Karl von Frisch, director of the Zoological Institute, University of Munich.

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GENERAL SCIENCE

Kettle on Stove Stops Shocking Static Sparks

➤ THE SIMPLEST and cheapest way to keep the shocking sparks of static electricity from jumping is to put the kettle on the stove and steam up the room. This solution, known to many housewives, is recommended by the Canadian National Research Council, Ottawa.

A high relative humidity, from 60% to 70%, is needed to make all surfaces in the room slightly conductive due to a thin moisture film that settles on them. Whether a little carbon dioxide must be present in the film is still controversial.

Keeping up the humidity is as effective as electrical grounding of objects and people in a room or the use of semi-conducting material for floors, shoes, etc.

Preventing the miniature flashes of lightning that cause the shocks when you touch door handles in a dry atmosphere is important when explosive fumes from cleaning fluids, anesthetics, gasoline and other substances are present.

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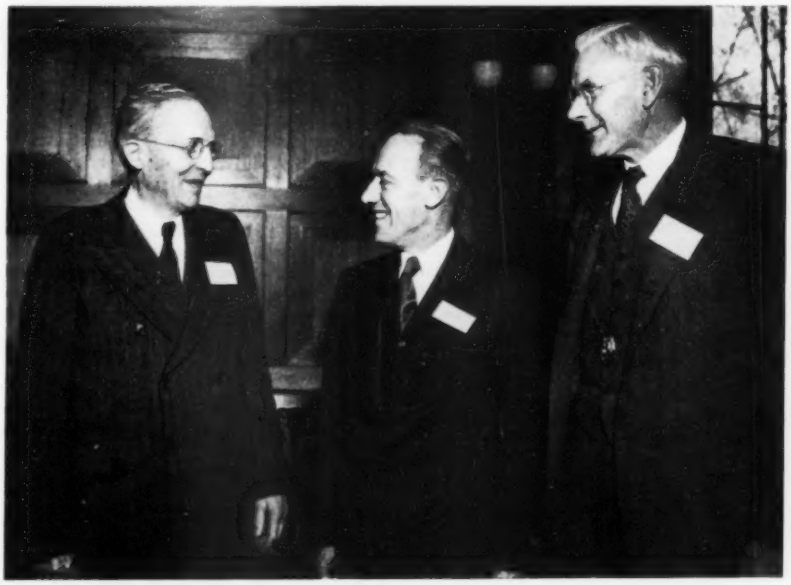
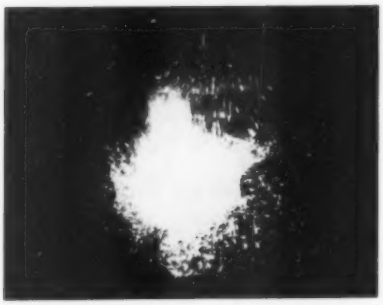


ACADEMY OFFICIALS—National Academy of Sciences officers, Dr. Fred Wright, retiring home secretary; Dr. Detlev Bronk, president, and Dr. Alexander Wetmore, new home secretary, discuss plans during the recent meeting of the Academy



LAVA SPOUT — The eruption of new lava from Mount Mihara. This picture was taken from a spot about 370 feet from lava-spouting crater. Lava temperature was 1100 degrees Centigrade.

VOLCANOLOGY

Mt. Mihara's Lava Flow Is Continuation of Eruption

➤ THE LAVA that recently spouted from Mt. Mihara volcano on Oshima Island in Tokyo Bay was a continuation of the eruption of that volcano from last July to September. Japanese scientists were expecting and had predicted this activity. Dr. Kenzo Yagi, professor of geology at Tokohu University, Sendai, Japan, now visiting at Carnegie Instituion, told SCIENCE SERVICE that the present continuing activity is "the greatest in the history of this volcano."

Science News Letter, May 5, 1951

ASTRONOMY

Discover New Comet Heading for Leo Minor

➤ A NEW comet, so faint that a small telescope is needed to see it, has been discovered in the northern sky. Sixth comet to be spotted this year, it was found by Dr. L. Kresak at the Skalnate Pleso Observatory in eastern Czechoslovakia on Tuesday, April 24.

The celestial object, of magnitude 10, is moving away from the sun, heading towards the constellation of Leo Minor, the Smaller Lion. Astronomers expect that the comet's path will turn southward. If it does not, the comet may hit the edge of Ursa Major, the Great Bear, of which the Big Dipper forms a part. When first discovered by Dr. Kresak, it was near Castor and Pollux, the Twins.

Notice of the new visitor from space was cabled by Mlle. J. M. Vinter-Hansen of Copenhagen to Harvard College Observatory, clearing house for astronomical news for the western hemisphere.

Photographs of the comet by astronomers at the Naval Observatory in Washington, D. C., on April 25 confirm the original report that it probably has only a short tail and does not have a nucleus.

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ASTRONOMY

Does Universe Thin Out?

World's largest telescope, Mt. Palomar's 200-inch giant, expected to give answer to question on whether space has uniform sprinkling of extragalactic nebulae.

➤ MAN IS about to discover whether the universe thins out at the farthest limit of the world's largest telescope, the 200-inch on Mt. Palomar.

That is so far off that it takes light a billion years to reach earth from the farthest galaxy of stars that can be seen. Since light travels 186,000 miles per second, it would almost exhaust the supply of zeros to write the number of miles from the extreme edge of the observable universe.

A big question is whether space is uniformly sprinkled with the great spirals of stars, the extragalactic nebulae. These are like the Milky Way in which we inhabitants of a planet of a star, the sun, are located.

Dr. Ira S. Bowen, director of Mt. Wilson and Palomar Observatories, Pasadena, Calif., told the National Academy of Sciences meeting in Washington, D. C. that a hint as to the answer to this question can be obtained in a few years, but the detailed verdict will be reached only after generations of astronomers have done their work.

Whether the universe is actually expanding at an explosive rate should also be discovered. The great spiral nebulae or "universes" are rushing away from us at a great rate, judging by the shifts in their spectrum lines that are observed. The older 100-inch telescope on Mt. Wilson at its limit reached nebulae which were receding at a velocity a seventh that of light. Scientists are eager to find out whether the relationship between the distance away and the seeming rush to escape is real. They want to know whether the universe is actually blowing apart like a gigantic bomb as has been suspected for some years.

Another great question is the amount of fuel available for keeping the stars stoked. Energy radiated by the sun and most of the stars comes from the transformation of hydrogen into helium in their very hot cores—they are counterparts of the proposed hydrogen bombs men are trying to make on earth.

Astronomers do not know how the stars can create or manufacture the heavier elements. One investigation planned with the new telescopes will find out whether all stars have the same relative abundance of heavier atoms. This may throw light on the origin of the heavier elements, which is now unknown.

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NEUROLOGY

Operation Stops Voices

➤ A NEW brain operation to stop the tormenting voices which some mental patients think they hear has been devised by Drs. Jonathan M. Williams and Walter Freeman of George Washington University Medical School, Washington, D. C.

In the operation a group of cells the size of a finger tip, called the amygdaloid nucleus, is removed from the temporal lobe on each side of the brain. These cells, the George Washington doctors believe, are part of an accessory hearing organization in the brain.

These brain cells are missed in the brain operation called prefrontol lobotomy which Dr. Freeman pioneered in this country for relief of some kinds of mental illness. In the prefrontal lobotomy operation certain nerve fibers, sometimes called the "worry" fibers, in the front of the brain are cut.

But some patients who have had the prefrontal lobotomy operation still hear voices or strange sounds that do not really exist. In such cases the operation may be considered a failure.

The first patient to have the new operation was a 20-year-old man who was hard of hearing and had to wear a hearing aid. The voices he heard were never profane, as some are in mental diseases. Sometimes they were encouraging, saying "C., you're going to hear all right some day." At other times they were unkind, saying "There goes that nut with the hearing aid."

The voices were so bad that the young man had to give up his job, could not enjoy reading, and at times was driven to dash off to another city in an effort to escape them.

Six weeks after the operation, the voices had become only indistinct sounds without words. They occurred only when he was particularly tired and at bedtime. He was wearing his hearing aid again, looked forward to getting a job, was having dates and going to parties, all of which he had given up previously because of the voices.

The doctors consider the results in this case "distinctly encouraging" and think it bears out their theory of an accessory hearing organization in the brain. More time and study, they state, will be needed to test the theory further.

Details of the operation are reported in the Medical ANNALS of the Medical Society of the District of Columbia (April).

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BIOLOGY

Exchange Hydrogen Hearts

That living processes within our bodies exchange energy by tossing protons back and forth is novel idea. Analogy to electric battery is drawn.

➤ A NEW idea of how living processes within our bodies exchange energy by tossing back and forth the hearts of hydrogen atoms, called protons, was presented to the National Academy of Sciences meeting in Washington, D. C.

Instead of electricity, which is the exchange of electrons, doing the work, the heavier protons are exchanged in the novel conception of Dr. Theodore Shedlovsky, of the Rockefeller Institute for Medical Research, New York.

The biological battery that makes our nerves work uses these protons in the same way that an electric battery is operated by electrons, which flow in electricity.

Explanation of life processes on an electrical basis has been hampered by the lack of good conductors, such as metals, within living matter. But water and acids, which do exist in the body, can conduct protons. Pure water is an 80% conductor of protons compared with metal being 100% conducting for the electrons that make up electricity.

Protochemistry, as Dr. Shedlovsky calls it by analogy with electrochemistry, seems to appeal to many who have studied life processes as a logical explanation of what can happen within living cells and tissues. But it will be very difficult to demonstrate the reality of the effect in living matter. Dr. Shedlovsky has experiments to show the existence of proton conductance, using the so-called glass electrode that is familiar to biologists. This is a tube of glass, through which the hydrogen ions, as the protons are also called, can pass.

The energy potential in such a glass "protode," as he calls it, combined with a fatty acid protode is sufficient to give the energy that living processes require.

"The biological bill for living energy can not be paid by electrons," Dr. Shedlovsky explained, "but it can be paid with protons."

In chemical terms, the new theory finds that the oxidation-reduction system does not operate in living matter, but the acid-base system does.

Just as theory has preceded practice in atomic energy and other fields, this new idea may help scientists to understand life more clearly.

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ELECTRONICS

Electronic Business System

➤ A COMPLETELY electronic record-keeping system — untouched by human hands—could be built starting right now. It might be used, for instance, to figure and make out gas bills or insurance premium payment notices, or to keep track of inventory for the military or in a department store.

But even though our knowledge is sufficient to build a pilot model of a electronic record keeper, it will need the investment of "one megabuck," states Dr. S. N. Alexander of the National Bureau of Standards.

One megabuck, he told the Washington section of the American Institute of Electrical Engineers, is $1,000,000. That much money and about three years of hard work would give a pilot model of the desired machine, he predicted.

The elements needed to build such a pilot model are available now. A pilot model is preferable to a full-sized machine, Dr. Alexander said, in order to iron out the "bugs" that might show up. Scientists could now build such a machine if they had the money.

Although the electronic computers have been used mostly for complicated mathematical problems, the steps involved in record keeping would be equivalent. To get information into the machine and out of it at the rate at which it is capable of chewing up data, using a magnetic recorder seemed most likely, Dr. Alexander said.

He likened the problem of feeding information to the machine by specially set-up instructions, as is now generally done, to feeding a modern production line with goods brought to the factory by ox-cart.

The magnetic recorder would work somewhat like the automatic weather forecasts that can be heard repeating current weather predictions on the telephone. The machine's recorder, however, would have, not information by voice, but information coded in somewhat the same way as teletype printers. The record player would then turn until it came to the desired information on the tape, John Doe's account number and account, for instance. This could then be processed by the arithmetic, or computer, unit according to instructions. The results would then be put back into the magnetic recorder file, either adding to the information already there or starting fresh, since magnetic tapes can be cleared of previous records.

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COTTON PARACHUTE — Square cargo chute made from strips of cotton muslin will replace the old rayon cargo chute. The unique strip design gives added strength to the new type chute.

AERONAUTICS

Square Cotton Parachute Replaces Rayon for Cargo

➤ A SQUARE of cotton muslin strips constitutes a new inexpensive type of parachute for dropping cargo packages from airplanes. It is designed to replace the more costly rayon cargo delivery parachute now in use.

Developed at the Wright-Patterson Air Force Base, Dayton, Ohio, the parachute has already successfully undergone severe field testing. The cotton chute will deliver 500 pounds of cargo from a plane traveling 175 miles an hour. Its rayon predecessor could handle only 300 pounds at 150 miles an hour.

The official tag for this parachute is the G-13. It is rated as "expendable" because cheap. The secret of its strength lies in the simple design. It is fabricated from nine strips of material attached to cotton tapes to form a 28-foot square.

Up-rushing air can escape through spaces between the strips, thus cutting down opening shock and enabling it to carry heavier loads.

One of these 28-foot square parachutes costs only half as much as the 24-foot rayon chute it replaces. For heavy cargo drops, a cluster of them may be used. Four of them can be used to replace the present large 64-foot nylon chute. The cost of the four is only one-fourth that of the nylon type.

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Diffraction *gratings,* which can be used to identify 100,000 color segments of the spectrum, are made of aluminum-coated glass and may have up to 30,000 parallel lines etched on their surfaces.

METALLURGY

Molybdenum Is Strong At Very High Temperatures

➤ FOR USE at high temperatures such as encountered in jet and turbine airplane engines, molybdenum metal of high purity is the material that is strongest and has long life.

Research at the Lewis Flight Propulsion Laboratory of the National Advisory Committee for Aeronautics, Cleveland, shows that sintered wrought molybdenum at temperatures in excess of 1,800 degrees Fahrenheit outclasses other materials, such as titanium carbide and inconel X alloy.

Even at higher temperatures, such as 2,400 degrees, molybdenum has high strength. Tensile strengths of 33,670 pounds per square inch at 1,800 degrees to 27,500 pounds per square inch at 2,400 degrees were reported by R. A. Long, K. C. Dike and H. R. Bear in the NACA test (NACA TECHNICAL NOTE 2319). The way the metal is worked and handled in manufacture has much to do with the strength of the finished metal.

Molybdenum is a metal that promises to have great importance in the U. S. defense program. It is already used widely as an alloying element in steel and for making electronic equipment. As yet there has been little experience in fabricating large pieces of the pure metal, such as would be required if molybdenum were used as a material for jet engines.

Molybdenum is one of the chemical elements, number 42 in the periodic table of the elements. It melts at 4,750 degrees Fahrenheit, almost 2,000 degrees above the melting point of iron.

The United States has an ample supply of molybdenum, since 90% of the world's production in the past quarter century has been met from within the North American continent.

Science News Letter, May 5, 1951

GEOLOGY

Search for Oil Aided by Magnetic Logging Device

➤ THE SEARCH for oil deep in the earth will be aided by a new magnetic logging device developed by scientists of the Magnolia Petroleum Company. Lowered into a drill hole in the earth, it records the magnetic properties of the various layers in the underground geological formations through which it passes.

The new magnetic logging instrument is based on the knowledge that geological formations, because of their magnetic properties, distort the earth's magnetism. From a measurement of the distortion, it is possible to calculate the structure of the formation. The device is designed to supplement information acquired at the surface of the earth with the magnetism-measuring magnetometer by giving more exact knowledge of underground formations.

The instrument easily distinguishes between sedimentary rock, the type capable of holding crude oil, and igneous rocks which are often highly magnetic because of their iron content. It also measures simultaneously the electrical resistance of rock. This resistance is another property of rock which is important to petroleum geologists.

The logging device is four feet in length, three inches in diameter and weighs 80 pounds. It is designed to withstand pressures of 10,000 pounds per square inch and, with some of its apparatus housed in a form of thermos bottle, is unaffected by temperatures up to 250 degree Fahrenheit.

Science News Letter, May 5, 1951

PUBLIC HEALTH

Test Tells When Dust Can Cause Lung Disease

➤ AN AID in the fight against dangerous dusts was shown at the Industrial Health Conference in Atlantic City, N. J.

It is a method for detecting the size and quantity of silica, cause of silicosis, and can be applied to detecting the toxic dust particles that cause another lung disease, asbestosis.

The method, said to be faster and more accurate than previous ones, was developed by Germain Crossmon of Bausch and Lomb Optical Company. A dust sample suspected of containing silica is placed on a glass slide and a drop or two of a liquid having the same refractive index as free silica is added. The preparation is then examined with either a dark-field or phase contrast microscope, using either polarized or unpolarized light.

Science News Letter, May 5, 1951

INVENTION

Carbon Monoxide Danger Offset by Detecting Device

➤ GAS DETECTING apparatus, particularly to detect dangerous carbon monoxide being discharged into the cabin of an airplane and releasing an off-setting gas, brought Charles W. Klug, Chicago, patent 2,549,974. Rights are assigned to Stewart-Warner Corporation of the same city.

Detection is by means of a yellow gel developed by the National Bureau of Standards which turns to a dark blue-green color in the presence of carbon monoxide. The gel is in a suitable container through which the air of the cabin passes. The apparatus also contains a light source and a photosensitive device which impinges light passing through the sensitive gel to change the conductivity of the device.

The change in light passing through the gel as it changes in color activates the photoelectric device which in turn releases a gas to restore the gel to its original color. Ozone is one of the gases and the oxides of nitrogen are others having this restorative action. They react on the carbon monoxide.

Science News Letter, May 5, 1951

IN SCIENCE

DENTISTRY

Dentist Can Help Prevent Cancer of the Mouth

➤ "YOUR dentist can help you prevent mouth cancer. See your dentist twice a year." This advice-giving slogan is suggested by Dr. Leonard B. Goldman, director of the cancer prevention and detection center at Queens General Hospital, Jamaica, N. Y.

Infected gums, jagged teeth, ill-fitting dentures (false teeth) and excessive smoking are factors in mouth cancer, Dr. Goldman said in a report to the JOURNAL of the AMERICAN DENTAL ASSOCIATION (April).

"How much these factors contribute to cancer is unknown," he said. "However, it is known that the incidence of cancer is much lower in the well-kept mouth than in the neglected one."

Urging that every dental examination include a check-up for suspected growths, Dr. Goldman said:

"Treatment of malignant tumors of the mouth needs the combined skill of the dentist and the physician. The dentist is the detective and the physician the prosecutor."

Deaths from cancer of the mouth have declined during the last 10 years, Dr. Goldman pointed out. In 1936 there were 4,081 deaths from mouth cancer, a mortality rate of 3.19 per 100,000, as compared with 1947 when there were 3,755 deaths, a mortality rate of 2.6 per 100,000. Dr. Goldman attributes this decrease in part to early detection of the disease by the dentist. Cancer of the mouth, like cancer elsewhere, may exist for some time without the victim being aware of it. But when a person visits his dentist regularly and the dentist is alert to the signs of mouth cancer, early cancers can be detected and cured.

Science News Letter, May 5, 1951

MEDICINE

Health Danger Is Seen in Perfect School Attendance

➤ DO NOT insist on perfect attendance records, the nation's elementary school teachers were warned by the American Heart Association, New York.

If children stay home with minor colds and sore throats, it will help cut down the danger of rheumatic fever and rheumatic heart disease. This is the reason for the warning. "Strep." infections may lead to rheumatic fever in susceptible children, the association points out in its new booklet, "What the Classroom Teacher Should Know—and Do—About Children with Heart Disease."

Science News Letter, May 5, 1951

ENCE FIELDS

TECHNOLOGY

Gas Pressure in Hole in Coal, Eliminates Blasting in Mines

▶ A FORWARD step to promote safety in coal mining will result from the use of a non-explosive device for breaking down the face of the coal, revealed by the Du Pont Company, Wilmington, Del., in which gas pressure is used to cause breakage.

This device utilizes the high pressure of a gas generated inside a steel tube which is inserted into an ordinary drill hole driven into the coal seam. Chemical reaction is started by an electric current which produces heat to initiate the action. The same heat destroys the starter wire as soon as electric current is no longer needed.

The tube which contains the chemical is closed at the outer end by a plug with electrical connections, and at the other with a disk that is ruptured by the compressed gases formed. When the gas has been liberated in sufficient quantities to create a desired pressure, the disk breaks and the gas rushes out to break down the face of the coal. No flame is produced.

This non-explosive method for use in mining coal is somewhat similar to one now employed which utilizes compressed air to break down the face of the coal. In the latter a heavy compressor is used and the compressed air is carried to the bore hole by hose and released from a special nozzle which is inserted in the hole.

The new Du Pont device is called a Chemechol. The chemicals used are not revealed. It is already under extensive field testing. The tube used can be refilled in the mine with another chemical unit and disk. The device can not be activated by small electrical stray currents, nor by the high currents used in mine power and lighting. It can not be detonated by blasting caps or high strength dynamite.

Science News Letter, May 5, 1951

MEDICINE

Paste of Germ Extract Heals Diabetic Gangrene

▶ MATERIAL EXTRACTED from the streptococcus germ and made into a paste is giving good results in treatment of diabetic gangrene, Drs. Leon V. McVay, Jr., and Douglas H. Sprunt of the University of Tennessee and John Gaston Hospital, Memphis, Tenn., report.

The materials are called streptokinase and streptodarnase. An excellent response in treatment of five cases of gangrene has been achieved with this new medicine. In some of the patients, the ailment had progressed so far that amputation was recommended.

When these patients refused to have an operation, the new preparation was put on the ulcerated areas. One of the patients had had two chronic ulcers on the right foot for 32 years. He had been on crutches for nearly 15 years. Various other forms of local medication had been tried without success.

When streptokinase and streptodarnase were applied, he spent 10 days in bed and then was given the freedom of the ward. Not long after, he was free of pain and could walk unaided.

"The evaluation of any conservative therapy in diabetic gangrene is difficult," the physicians report. "The improvement in these cases was undoubtedly aided by the regulation of diet and insulin administration of supplementary vitamins, control of physical activity and treatment of secondary infections.

"However, there can be little doubt that the clinical results were essentially due to streptokinase and streptodarnase. It appears that they are of great value in the conservative treatment of diabetic gangrene."

Results of the study are published in the ARCHIVES OF INTERNAL MEDICINE

Science News Letter, May 5, 1951

MEDICINE

Romans Treated Headaches With Electroshock from Fish

▶ ELECTROSHOCK treatment, modern method of treating some patients with mental sickness, was used by physicians of ancient Rome, Dr. John Fulton, professor of the history of medicine at Yale University reports.

For the electricity, the Roman physician, Scribonius Largus, used the discharge of an electric fish, the Torpedo. He delivered the shock to the head for the relief of headache and also to lessen the pain in childbirth.

Science News Letter, May 5, 1951

INVENTION

High Quality Magnesium by Alloying With Rare Earths

▶ WIDER USE of magnesium in many applications is promised with British-developed magnesium alloys which have improved mechanical properties, offering advantages both in the cast and wrought conditions. They contain 85% magnesium, the rest being certain so-called rare-earth metals, neodymium, lanthanum and others. Cerium is removed from the rare-earth metals used in order to improve resistance to corrosion.

Alfred Claude Jessup, Edward Frederick Emley and Philip Andrew Fisher are the inventors. All are at Clifton Junction, near Manchester, England, and their rights to patent 2,549,955 have been assigned to Magnesium Elektron Limited of the same address.

Science News Letter, May 5, 1951

BIOLOGY

Efficient Algae Factory Is Step to Food for Future

▶ THE MOST efficient commercial production of algae, best way so far of capturing the sun's energy, was announced by Dr. Jack E. Myers, director of the University of Texas algal physiology laboratory, Austin, Tex.

For each gallon of water in his algae-growing apparatus, Dr. Myers gets a half-pound of algae, whereas a pond will produce that amount of growth as a green scum with 50,000 gallons of water.

Algae are simple plants. The Chlorella species is capable of multiplying seven times in volume in a single day under proper conditions.

Scientists expect algae to be used in the future as food for animals and as raw materials for making fats, oils and other organic materials.

With further development, algae might feed a blockaded nation such as Japan might become in an extension of war in the Far East.

The Myers process grows the algae in a narrow space between two glass tubes, one inside the other. Carbon dioxide, which the algae need as their principal raw material, is bubbled through the water. Sunlight supplies the energy. Added minerals are necessary.

The Myers process has solved previous difficulties in producing a high concentration of the plants in thin layers, and the exact control of introducing minute amounts amounts of needed iron and other minerals. The new process is reported to be eight times as efficient as a similar system recently reported.

Science News Letter, May 5, 1951

AERONAUTICS

British Aircraft Engine Both Piston and Jet

▶ A COMPOSITE engine for airplanes, which has both piston and jet power, has been developed in England. It is the Napier Nomad, and is actually a combination of a piston engine and a turbo-jet power plant.

The gases for driving the turbine are produced by a highly supercharged piston engine and not by static combustion chambers. Details of the combination have not been revealed. Low fuel consumption is said to be an advantage. This means extra range for long-distance civil and military planes.

Another new turbo-jet engine just revealed is the British Olympus which is said to have very low fuel consumption. There is a probability that this engine may be built in America by the Curtiss-Wright Corporation as part of the long-term agreement between the two companies for mutual engineering and technical aid.

Science News Letter, May 5, 1951

NUTRITION

Antibiotics for Poultry and Pigs

Once costly curiosities, the antibiotics are now being fed to chickens, turkeys and pigs. Result: They grow faster, reach market age sooner, and consume less food.

By J. D. RATCLIFF

➤ LESS THAN a decade ago penicillin was a costly curiosity, often unobtainable even when a life was at stake. Today it is so cheap and plentiful that wise farmers are feeding it to pigs, turkeys, and chickens—with eye-opening results. Penicillin, aureomycin, terramycin, bacitracin and other antibiotics somehow prod animals to grow faster. They reach market size sooner and consume less food. Result: more meat for the world's dinner table—and budget relief for harried housewives.

The spectacular growth-promoting powers of antibiotics will inevitably rank as an all-time great discovery in animal nutrition. As little as $1.60 worth of drug per $100 worth of feed will hasten pig growth as much as 30%, turkeys 20% and chickens 10%. Since animals mature earlier under this regimen, they require less grain to produce a pound of meat. On top of this, the miracle drugs minimize many animal diseases that cost farmers millions of dollars a year.

The discovery came more or less by accident. For years, farmers have known that pigs, chickens and turkeys do not thrive on an all-grain diet. They must have a supplement of animal proteins—skim milk, fish meal or meat scraps. Until 1948 no one knew what the essential "animal protein factor" was. Then it was identified as vitamin B12.

Crudely extracted from broths that had been used to produce antibiotics and fed to chicks and other animals, it gave growth a mighty kick forward. Three or four weeks after hatching, chicks might weigh 45% more than the usual average.

Research men assumed it was the vitamin that did the job. Then a group at Lederle Laboratories fed chicks pure B12—and they grew no faster than normal. It was obvious that something else in the crude extract was performing the growth miracle. In time, it turned out to be an antibiotic left behind after the drug for human use had been extracted.

Virtually every state agricultural experiment station in the country grasped at this promising lead. Dr. Damon Catron, of Iowa State College, reported that pigs fed aureomycin grew 15% to 31% faster than usual. Dr. James McGinnis, of the State College of Washington, found that at the end of 84 days pigs on antibiotic feed weighed 94 pounds, whereas others weighed only 67. A Missouri farmer noted that his hogs were ready for market in six months instead of seven or eight. Further, antibiotics made runt pigs grow to normal—important since the average litter contains at least one runt.

Antibiotics Save Feed

Careful studies showed that antibiotics would save 30 to 50 pounds of feed per 100 pounds of pork produced. Projected to the entire pig population (nearly 100 million animals), this indicates a potential annual saving of about two million tons of feed—worth about $200 million at current prices.

Dr. Catron summarized the impact of antibiotics: "For the swine producer it will mean faster and more efficient production. This will be reflected in cheaper pork chops and bacon for the consumer."

Antibiotics hold equally great promise for poultrymen. It takes 11 to 12 weeks to get a three-pound broiler ready for market. Antibiotics have cut this to as little as nine weeks. The drugs have hastened egg production by as much as 15 days. Further, antibiotic feeds cut death rates. Approximately 20% of all chicks hatched die before reaching market or laying age. Experiments

AUREOMYCIN FED—Dr. Robert J. Lillie, left, poultry husbandry, and Dr. H. R. Bird, in charge of poultry investigation, U. S. Department of Agriculture Experiment Station, Beltsville, compare two hens. The one on the left ate a normal diet while the sleek fat hen on the right had aureomycin added to her feed, giving her a one-quarter pound weight advantage. Dr. Bird's test tube shows amount of aureomycin—10 grams—added per ton of feed to make this difference.

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conducted by Charles Pfizer & Company, makers of terramycin, indicate this death rate can be cut in half.

Turkeys Also Responsive

Turkeys, particularly sensitive to disease, are similarly responsive in hardiness and growth to antibiotic feeds. In a number of experiments deaths have been cut to 40% of normal.

Antibiotics will not make a chicken or pig grow abnormally large. They merely cut the time required to reach full growth—with a consequent saving of food and labor.

How do the antibiotics achieve their remarkable effect? There are a number of theories, none of them proved. They may kill off intestinal bacteria which compete for food; or destroy bacteria which produce growth-slowing toxins; or contain some unidentified nutrient.

Will the drugs stimulate growth of cows, sheep and goats? It is too early to say, since this work is only a few months old. But the answer will likely be no. These animals have pouch-like rumens, or stomachs, in which bacteria act on foods to produce essential vitamins. Antibiotics might kill off these valuable microbes—doing more harm than good.

Preliminary evidence indicates the antibiotics will be useful elsewhere in the animal world. They have hastened growth of the white rats used by medical experimenters. They appear to produce sturdier and healthier pups, and have even been used with good results in fish hatcheries. For reasons as yet unexplained, they seem to produce mink larger than normal; in one experiment they increased the size of pelts 20%.

Affect Other Animals

Almost as soon as the first experimental results were announced, commercial feed mixers started using antibiotics. Drug makers who had once measured antibiotics on chemists' balances started selling crude extracts by the boxcar, and now foresee an expanding market worth millions of dollars a year. Most of the antibiotics for this market are derived from broths that once went down sewers. After a certain point it is no longer economical to extract drugs for human use, but the spent broths contain enough antibiotic to stimulate animal growth.

Will antibiotics added to milk or cereal promote healthy growth of infants and young children? As yet, no one knows. But experiments to determine the effect are under way—experiments which will take several years to complete. For the present, antibiotics are significant enough for the new job they are beginning to do on a grand scale—assuring more meat at a lower cost at a time when skyrocketing prices are a matter of national concern.

This article was prepared for SCIENCE NEWS LETTER in cooperation with the READER'S DIGEST. It will appear shortly in that magazine.

Science News Letter, May 5, 1951

CHEMISTRY

Synthetic Steroid Chemical

➤ A CHEMICAL achievement which promises to aid the fight against cancer or heart disease or arthritis has been made by Prof. Robert B. Woodward and associates of Harvard University.

"The first total synthesis of a complete steroid" chemical is their accomplishment.

Steroids are a group of chemicals that include sex hormones, cortisone, bile acids which are the starting material for cortisone, some cancer-causing substances and the non-starch part of some plant chemicals such as the heart medicine, digitalis.

The chemical Prof. Woodward has made in his laboratory is not cortisone. It is not the related anti-arthritis chemical, compound F. Opinions are divided on whether it can be used as the starting point for synthesizing compound F or cortisone through a process by-passing the bile acids.

The practical value of the new synthetic chemical remains for the future to tell. It was pointed out, however, that the processes for converting one steroid chemical into another are so well worked out that the synthesis of natural steroids may be accomplished in the near future. Natural steroids are the ones found in plants and produced by certain glands such as the adrenal glands that produce cortisone.

Cortisone synthesis in the laboratory or manufacturing plant starts with another animal product, bile acids. Prof. Woodward's synthesis of a steroid starts with a simple coal tar derivative, orthotoluidine.

Working with Prof. Woodward at the completion of the synthesis were: Dr. Franz Sondheimer, Dr. David Taub, Dr. Karl Heusler, Dr. W. M. McLamore, Mrs. Dorothy Voitle and Mr. Irving Oswar. Financial support was given by Merck and Company, manufacturers of cortisone, and Research Corporation of New York.

Science News Letter, May 5, 1951

MEDICINE

Cortisone Helps Delay Liver Degeneration Due to Diet

➤ CORTISONE CAN help delay liver degeneration due to faulty diet, Dr. Klaus Schwarz, special research fellow of the U. S. Public Health Service, has discovered.

Dr. Schwarz's studies were made on rats who got their starch and sugar chemistry upset by feeding them a diet that was almost one-third yeast. This caused severe damage to their livers.

The liver damage was very like that seen in humans suffering from the almost always fatal disease, acute yellow atrophy of the liver. This suggests that cortisone might help human patients with this particular liver disease. Dr. Schwarz has not yet been able to make trials of this. European scientists, however, have used another hormone from the adrenal glands which produce cortisone to treat epidemic hepatitis. This is the liver disease that is believed caused by a virus and sometimes called jaundice, because of the yellow skin color it gives. The European doctors claim that the adrenal gland hormone helped in this disease.

Details of Dr. Schwarz's studies are reported in the journal, SCIENCE (April 27).

Science News Letter, May 5, 1951

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BOTANY

NATURE RAMBLINGS

Bloodroot

➤ A GOOD theme for a botanist-poet might be supplied by the bloodroot, that now stars our woods. Such a one might well hail the little white flower as a "modest poppy" that

"Crowds back its carmine blushes to its root
And turns toward all ardors of the sun
A front demure and white as any nun."

For the bloodroot is really a close cousin of the poppy, and the red that its relative flaunts on its face, this little white spring blossom expresses only in its blood-red sap. It would not be exactly correct, however, to say that the red sap is found in its root, for the thick underground part of the plant is really a rhizome or subterranean stem, from which the true roots, as well as the overground stems, take their rise.

Few wild flowers are more lovely than the bloodroot, *Sanguinaria canadensis*. It grows in rich, shady woods, on rocky hillsides, in thickets and on waste lands over most of the United States east of the Rocky Mountains. Only fleeting enjoyment, however, comes from its golden-centered, poppy-like blossoms, since the snow-white petals show themselves for just two or three April or May days before departing.

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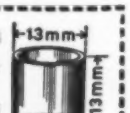

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The sap of the subterranean stem is somewhat thick and milky under its red color, which is another point of kinship with the milky-juiced poppy tribe. And as the juice of the poppy contains a poisonous principle used in medicine, so also does the juice of the bloodroot. Under the Latin name, Sanguinaria, the dried rhizome used to find a more or less prominent place on druggists' shelves, though it is little used now.

The bloodroot is one of the small number of native American wildflowers that needs little warning against reckless bouquet-gathering, due again to that same thick, red, rather irritating juice. Children picking flowers in the woods sometimes take a handful of its attractive, though short-lived white flowers; but the appearance of their hands and dresses usually causes their alarmed mothers to place further bloodroot gathering under stern injunction.

Science News Letter, May 5, 1951

MEDICINE

Hormone Controlling Fat Discovered in Pituitary

➤ A NEW hormone which triggers the body's mechanism for mobilizing fat has been discovered. It is produced by the pituitary gland in the head which also produces a growth hormone and ACTH, now famous as an arthritis remedy.

The new hormone is not ACTH, and apparently acts directly instead of through the adrenal glands, which is what ACTH does. But there is a tie-up with the adrenal gland cortex, because the trigger does not work unless there is sufficient cortisone circulating in the blood.

Discovery of this new hormone, which has not yet been identified, was announced by Dr. Louis Levin of Columbia University at the New York Academy of Sciences.

Science News Letter, May 5, 1951

PHYSICS

New Sun Energy Theory

➤ THE SUN'S raging energy comes mostly from a sort of hydrogen bomb reaction, a crashing of ordinary hydrogen atomic hearts into one another.

Outweighing the famous "carbon cycle" of intricate atomic transmutations considered heretofore the main process in stoking the sun, the simple reaction of proton upon proton is considered by two physicists reporting to the American Physical Society meeting in Washington, D. C., as the main way stars, including our sun, get their energy.

Dr. Edward Frieman of Brooklyn Polytechnic Institute and Dr. Lloyd Motz of Columbia University applied to this stellar energy problem new complex mathematical calculations as yet unpublished by other investigators.

The protons or ordinary mass one hydrogen nuclei interact with each other to produce a double-weight hydrogen atom and release energy in considerable amount. This takes place at the great heats that are achieved within our sun.

Unless such atomic alchemy does occur, the sun would run down and gradually cease to shine, leaving the earth cold and lifeless.

The famous "carbon cycle" was worked out in pre-A-bomb days by Drs. Hans Bethe, now of Cornell University. It explains the heat of the sun by a cycle of nuclear changes involving carbon, hydrogen, nitrogen and oxygen and leading to the disappearance of hydrogen and the forming of helium. A little matter is turned into energy, as in the atomic bomb.

This still happens but the new work by Drs. Frieman and Motz shows that the conversion of two atoms of hydrogen into deuterium, or double or heavy hydrogen, is likely to give more enery for the sun's use than the "carbon cycle." The energy is created from matter in both cases according to the famous Einstein relationship.

While the probable material of the hydrogen bomb now being developed by the Atomic Energy Commission is still highly secret, it is likely that triple-weight hydrogen or tritium would need to be used instead of ordinary hydrogen because here on earth we do not have the very high temperatures of the sun.

Science News Letter, May 5, 1951

ZOOLOGY

Moose, Bull or Cow, Is Reluctant to Charge Human

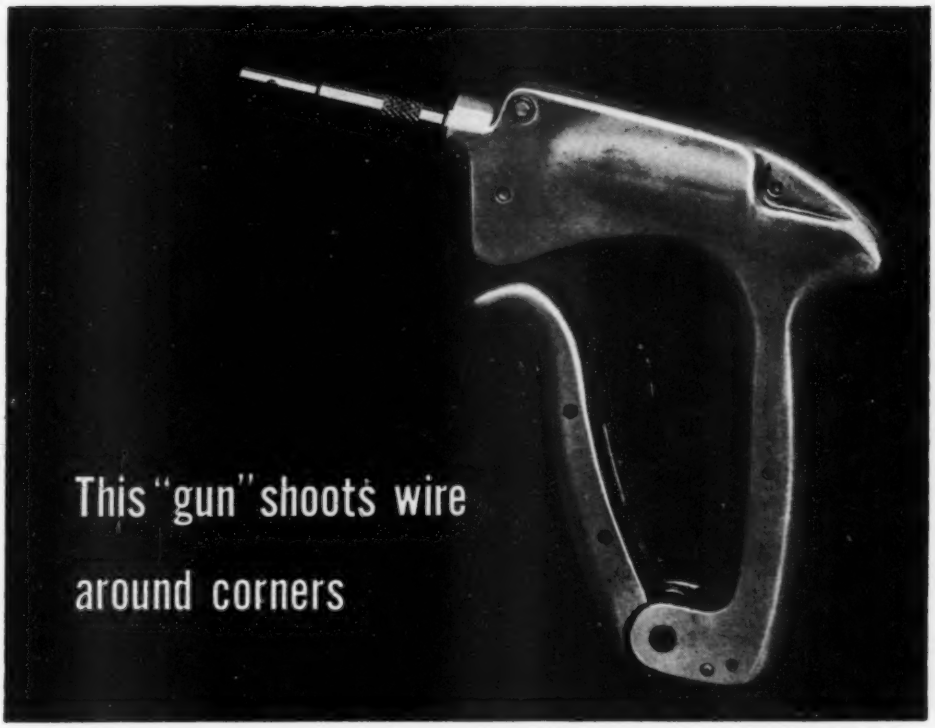
➤ "A MOOSE of either sex will not molest or attack a human without giving ample warning and sufficient time for retreat."

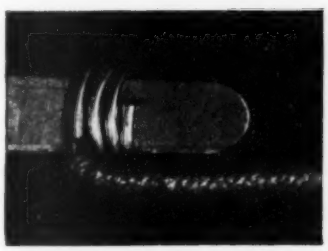
So says Dennis E. Hess, Park Ranger at Yellowstone National Park, and he expects that his opinion will "no doubt draw fire." Most everyone has heard or read hair-raising tales of encounters with bull moose in the fall, tales of people being pursued, treed and even boldly attacked.

From his own personal observations Ranger Hess concludes that anyone being attacked by a moose must really have asked for it. He tested the reaction of all ages of moose at the salt lick of Thorofare Station in Yellowstone Park.

Reporting in YELLOWSTONE NATURE NOTES (March-April), Ranger Hess notes that none of the moose he encountered ever pressed forward after he retreated, and that ample time to retreat was given for anyone who was not looking for trouble. He also found that the more he lost his identity as a human, the more prestige he would gain. Holding up a sheet, carrying a tub or a saddle, wearing a poncho and chaps, he states, would usually result in their retreat.

Science News Letter, May 5, 1951





Close-up of connection made with new tool—neat, tight windings.

IT DOESN'T take long to wrap *one* wire around a terminal and snip off the end. But *hundreds of millions* of such connections are being made each year.

Now this job is done much more efficiently with a new wire wrapping tool invented at Bell Laboratories. This "gun" whirls wire tightly around terminals before solder is applied. The connection is better and there is no waste wire.

The hand-operated wrapper shown here is for the telephone man's tool kit. Power-driven wrappers developed by Western Electric, manufacturing unit of the Bell System, are speeding the production of telephone equipment. The gun's small nozzle reaches where fingers couldn't—a big advantage these days when parts are made smaller as well as better.

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ASTRONOMY

One of Strangest Stars

One of strangest stars in the universe is in Capella. This member of a twin-star team does not resemble any known single star, Dr. Struve reports.

➤ ONE OF the strangest stars in the universe is a member of the stellar team making up Capella, the second brightest star in the northern sky, Dr. Otto Struve of the University of California told members of the National Academy of Sciences meeting in Washington, D. C.

Streams of whirling gas within the atmosphere of this giant sun race around as fast as in any star yet observed, Dr. Struve estimates.

"This star does not resemble any known single star. It may be subject to large changes of a kind we have not found elsewhere in the universe," Dr. Struve pointed out.

Capella is visible these spring evenings in the northwest, in the constellation of Auriga, the charioteer. It has been known for several decades that Capella is composed of two giant stars, of about equal brightness. These twin stars are so close together observers always see them as one, but astronomers using Mt. Wilson's 100-inch telescope have actually seen them both. There is a third distant companion, a red dwarf.

The two giant stars circle around each other every 104 days. One of these giants is similar to our sun, but ten times as large; the other is somewhat like Procyon, bright star in Canis Minor, the smaller dog.

Astronomers have failed to realize, however, in how many ways this star differs from Procyon and other stars of the type it most nearly resembles. Capella has played an exceptionally important part in the development of theoretical astrophysics, a role it probably would not have been given had its peculiarities been fully appreciated.

Several decades ago the late Sir Arthur Eddington, famous British astronomer, used Capella as one of the two anchors to which he attached his famous mass-luminosity relation, the other anchor being the sun. This star was fundamental to his theory that massive stars of necessity shine brightly.

It was Capella along with other stars that led Sir Arthur to conclude that a body of gas having less than a tenth of the sun's mass would be unable to shine by its own light, whereas one of a thousand times the sun's mass would be subject to so great internal pressure of radiation that it would probably burst.

The star's spectrum—its light fanned out to its rainbow colors—is like a coded message requiring not one but two keys for its decoding. It is easy to match lines in Capella's spectrum with those of a star like the sun or Arcturus, in Bootes, the herdsman, high in the northern sky. So one of the twin stars is definitely of this type.

The spectrum of the other star making up bright Capella is unlike that of any other star Dr. Struve has encountered. Its strong spectrum lines are enormously enhanced and broadened, and its weaker lines are completely blocked out, he says.

Once again astronomers are reminded that close double stars are not like single stars. The two disturb each other and make them "peculiar."

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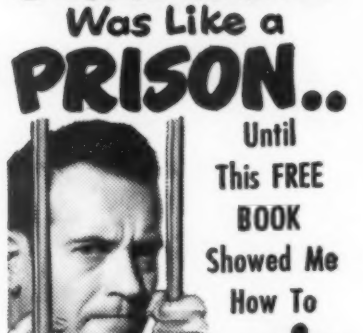

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ASTRONOMY

Earth and Other Planets Began as Flat Disks

The earth, Venus, Jupiter and other planets began as flat gaseous disks, Dr. Gerard P. Kuiper of the University of Chicago's Yerkes Observatory told members of the National Academy of Sciences in Washington D. C.

These extensive disks of gases, planets in the making, were formed from the same cosmic cloud that gave birth to the sun, Dr. Kuiper pointed out. The cloud itself was relatively flat, which accounts for the fact that the planets tend to move around the sun in about the same plane. During their creation they revolved at about the same distance from the sun as today.

Part of each planet's original gaseous matter was lost as it contracted into a more stable, more nearly round planet. At first the material was ejected through eddies set up by tremendous motions in the protoplanet's atmosphere, but later when the planet had become smaller and more compact true evaporation took place.

Science News Letter, May 5, 1951

MEDICINE

Adrenal Gland Cortex May Play Part in Liver Cancer

➤ FIRST EVIDENCE that the adrenal gland cortex, famous for production of cortisone, may play an important role in liver cancer has been obtained by Drs. Alexander Symeonidis, Ambadas S. Mulay and F. H. Burgoyne at the U. S. National Cancer Institute.

Rats could be kept from getting experimental liver cancer by a chemical relative of cortisone, desoxycorticosterone, these scientists discovered.

They fed the rats a semi-synthetic diet containing butter yellow. This cancer-causing dye chemical has nothing to do with butter, but gets its name from its color. Half the animals that lived six months on this diet developed liver cancer. But when animals on the same diet were given shots of the cortical hormone, the occurrence of cancers was drastically reduced.

The fact that the adrenal gland influences the function of liver cells and the regeneration of damaged livers has been known previously, but not the connection with liver cancer, it was pointed out.

Dr. Symeonidis and associates reported their findings at the American Association for Cancer Research in Cleveland.

Science News Letter, May 5, 1951

• Books of the Week •

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THE BUTTON SAMPLER—Lillian Smith Albert and Jane Ford Adams—*Barrows*, 185 p., illus., $2.00. For collectors.

COMPLETE INDEX TO MOST-OFTEN-NEEDED RADIO DIAGRAMS AND TELEVISION SERVICING INFORMATION—*Supreme Publications*, 26 p., paper, 25 cents, or free upon request to publishers by servicemen, engineers and libraries. A master index to fifteen volumes in these fields.

ELECTROPLATING: For the Metallurgist, Engineer, and chemist—J. B. Mohler and H. J. Sedusky—*Chemical Publishing Co.*, 257 p., illus., $5.00. For the person with a good background in science but no knowledge of electroplating.

EVERGLADES NATIONAL PARK—*National Park Service*, 16 p., illus., paper, single copies free upon request to publisher, Washington 25, D. C. Telling what you can see in this beautiful wildlife sanctuary in which unusual birds abound.

EVOLUTION EMERGING: A Survey of Changing Patterns from Primeval Life to Man—William King Gregory—*Macmillan*,, 1749 p., in two volumes, illus., $20.00. A new formulation of Darwin's Theory of Evolution. "Homo sapiens," says the author, "is indeed the heir of all the ages and the net product of an incalculable series of lower generations."

EXPERIMENTAL SPECTROSCOPY—Ralph A. Sawyer—*Prentice-Hall*, 2nd ed., 358 p., illus., $6.65. Designed for students of spectroscopy and for those in laboratories who wish to use the procedures.

EXPLORATIONS IN EASTERN PALESTINE, IV—Nelson Glueck—*American Schools of Oriental Research*, 2 vols., 711 p., illus., $6.00 a volume. Revealing a pattern of rise and fall of civilizations in Transjordan and the Jordan Valley which has repeated itself down to the present. The changes of fortune in historic times are to be attributed, the author believes, not to major fluctuations in climate, but to human nature.

FLOWERS OF THE SOUTHWEST DESERTS—Natt N. Dodge—*Southwestern Monuments Association*, 112 p., illus., paper, $1.00. To introduce the common flowers of the Southwest to newcomers.

FREEDOM AND CULTURE—Compiled by UNESCO—*Columbia University Press*, 270 p., $3.75. Six studies by different experts on man's right to freedom in various fields—education, science, information, art and literature.

GEOLOGY OF SOUTHWESTERN SANTA BARBARA COUNTY, CALIFORNIA—T. W. Dibblee, Jr.—*California Division of Mines*, 95 p., illus., paper, packaged with maps and plates, $5.00. Reporting not only the geology of the area but also a history of the early days.

GRAND CANYON NATIONAL PARK—*National Park Service*, 16 p., illus., paper, single copies free upon request to publisher, Washington 25, D. C. Describing the sights that await persons interested in geology, archaeology, and animal and plant life.

INDUSTRIAL HYGIENE—Theodore F. Hatch—*Mellon Institute*, 2 p., illus., paper, reprint from Industrial and Engineering Chemistry, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa.

THE MEASURE OF OUR LAND—J. G. Steele—*Soil Conservation Service, U. S. Dept. of Agriculture*, 18 p., illus., free upon request to publisher, Washington 25, D. C. Describing the land-capability inventory now under way.

A MONOGRAPH OF THE COLLEMBOLA OR SPRINGTAIL INSECTS OF NEW YORK STATE—Elliott A. Maynard—*Comstock*, 339 p., illus., $7.50. Dealing with a neglected order of insects which propels itself through the air by bringing its tail down like a spring onto the surface on which it rests.

MUIR WOODS NATIONAL MONUMENT—*National Park Service*, 6 p., illus., paper, single copies free upon request to publisher, Washington 25, D. C. Tourist information on this area in California where the trees grow as tall as 246 feet with bark a foot thick.

NATURAL BRIDGES NATIONAL MONUMENT—*National Park Service*, 6 p., illus., paper, single copies free upon request to the publisher, Washington 25, D. C. Descriptive folder with information for tourists. The area contains thousands of ruins of archaeological interest as well as the interesting geological formations.

THE NEUROSES: Diagnosis and Management of Functional Disorders and Minor Psychoses—Walter C. Alvarez—*Saunders*, 667 p., $10.00. A book by an internist for other internists, to help them in handling the cases of psychoneurosis they get in the course of a general practice.

PHILOSOPHY FOR THE COMMON MAN—Heinrich F. Wolf—*Philosophical Library*, 189 p., $3.50. A philosophical work by a practicing physician.

PUBLIC HEALTH AREAS AND HOSPITAL FACILITIES: A Plan for Coordination—Joseph W. Mountin and Clifford H. Greve—*Govt. Printing Office*, Public Health Service Publication No. 42, 119 p., illus., paper 60 cents. A guide for regional planning so that local health department can work with hospital as a team.

RABELAIS: His Life, the Story Told by Him, Selections Therefrom Here Newly Translated and an Interpretation of His Genius and His Religion—John Cowper Powys—*Philosophical Library*, 424 p., $3.75. Intended as an introduction to the famous physician and humorist, of whom, the author contends, we have received a wrong impression through his first translator, the "heavily-moving North British genius" Urquhart.

THE RETURN FROM BABEL—Gerald M. Spring—*Philosophiacl Library*, 188 p., $3.50. A philosophical approach to some current problems.

SCOVILLE'S THE ART OF COMPOUNDING—Glenn L. Jenkins and others—*Blakiston*, 8th ed., 515 p., illus., $7.50. A practical how-to-do-it book for pharmacists and students.

THE SOVIET MILITARY ORGANIZATION—*Armed Forces Information School*, 64 p., illus., paper, 50 cents. A series of authoritative articles compiled from the Army Information Digest.

SYMPOSIUM ON CYTOLOGY—William L. Doyle, Hans Ris, Franz Schrader, and C. Leonard Huskins—*Michigan State College Press*, 69 p., illus., paper, $2.00. Papers presented at a symposium for the purpose of calling the attention of other biologists to some of the major problems of cytology.

THE STORY OF OUR TIME: Encyclopedia Yearbook 1951—*The Grolier Society*, 432 p., illus., $10.00. Report on the events of the year 1950. Watson Davis is author of the sections on Science Highlights in 1950 and Science Previews.

TONTO NATIONAL MONUMENT—*National Park Service*, 6 p., illus., paper, single copies free upon request to publisher, Washington 25, D. C. Information to tourists. This area in Arizona contains remains of cliff dwellings occupied in the 1300's by the Salado people.

UNITED STATES COINS: A Guide to Values—Wilfrid Dellquest—*Barrows*, 187 p., illus., $2.00. A book to set you looking through your change pocket to see what unsuspected treasure you may have there.

WAVEGUIDE HANDBOOK—N. Marcuvitz, Ed.—*McGraw-Hill*, 428 p., illus., $7.50. One of the Radiation Laboratory Series prepared at MIT to present results of many research programs conducted during the war in connection with development of radar and related techniques.

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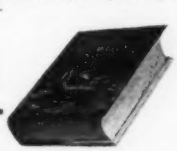

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EXPOSURE SUIT, an Air Force development for airmen downed in water, will keep the wearer afloat and protect him from the weather. It is a one-piece coverall of water-proof material, sponge rubber closing around the neck, water sealed zipper in front, and rubber straps around the wrists.

Science News Letter, May 5, 1951

CAR PARKER, in use on an outdoor parking lot on which two structures with four floors have been erected, is an electrically-operated platform and elevator. The car driven on it is run to the proper ground position, then elevated and rolled into a stall.

Science News Letter, May 5, 1951

SMOKING DEVICE, neither a pipe, cigar or cigarette, consists of a straight tube with a mouthpiece on one end and a removable perforated cap on the other. Tube is filled with smoking tobacco by removing the cap end. No ashes can drop from the tube until the end is removed.

Science News Letter, May 5, 1951

DE-ICING SHINGLES, recently patented, are designed for use on the eaves of a roof to prevent ice or snow accumulation. These composition shingles have embedded in them electrical heating elements much like those in an electric blanket.

Science News Letter, May 5, 1951

HATS AND HANDBAGS are crocheted at home with a viscose process yarn that looks and feels like straw, as shown in the picture. It comes in metallic and other colors but the preferred is perhaps white with gold, silver and copper metallic threads. Instruction books are available with the yarn.

Science News Letter, May 5, 1951

STICK-ON LABEL, which is applied merely by pressure and will adhere to most any material with a clean surface, is made of two layers of acetate with a white waxy substance between them. A stencil, not a pencil, is used in writing on it. The stencil's pressure destroys the waxy layer, exposing the bottom colored layer to view.

Science News Letter, May 5, 1951

TYPEWRITER TYPE cleaner is a dry rubber tool which will wipe the type clean without mess, leaving faces bright and shiny. A few strokes each morning with this inexpensive device is sufficient for the day. It comes in two sizes, one being a double size for Royal machines only.

Science News Letter, May 5, 1951

SPECIAL CANS, to provide pure drinking water in lifeboats and during emergencies when other water is not available, have an enamel protective coating on the outside but no inner lining as they are made of plated tempered steel. The can, only partly filled before sealed, will float on the sea.

Science News Letter, May 5, 1951

Do You Know?

Oak wilt, a disease of forest trees, can be detected from airplanes flying at low altitude because this fungus disease produces a bronzing of the oak leaves.

Most *geysers* of the world are in western America, Iceland and New Zealand.

Oysters nine inches long were common along the American coast in early colonial days.

The original home of *lettuce* is thought to be India.

It is the *aluminum* hydroxide in bauxite that makes this clay a valuable ore from which to obtain the aluminum oxide which, in turn, yields the pure metal.

Some California beach sands contain *uranium* but probably not in great enough quantity to provide an economical source of this atomic-energy element.

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